

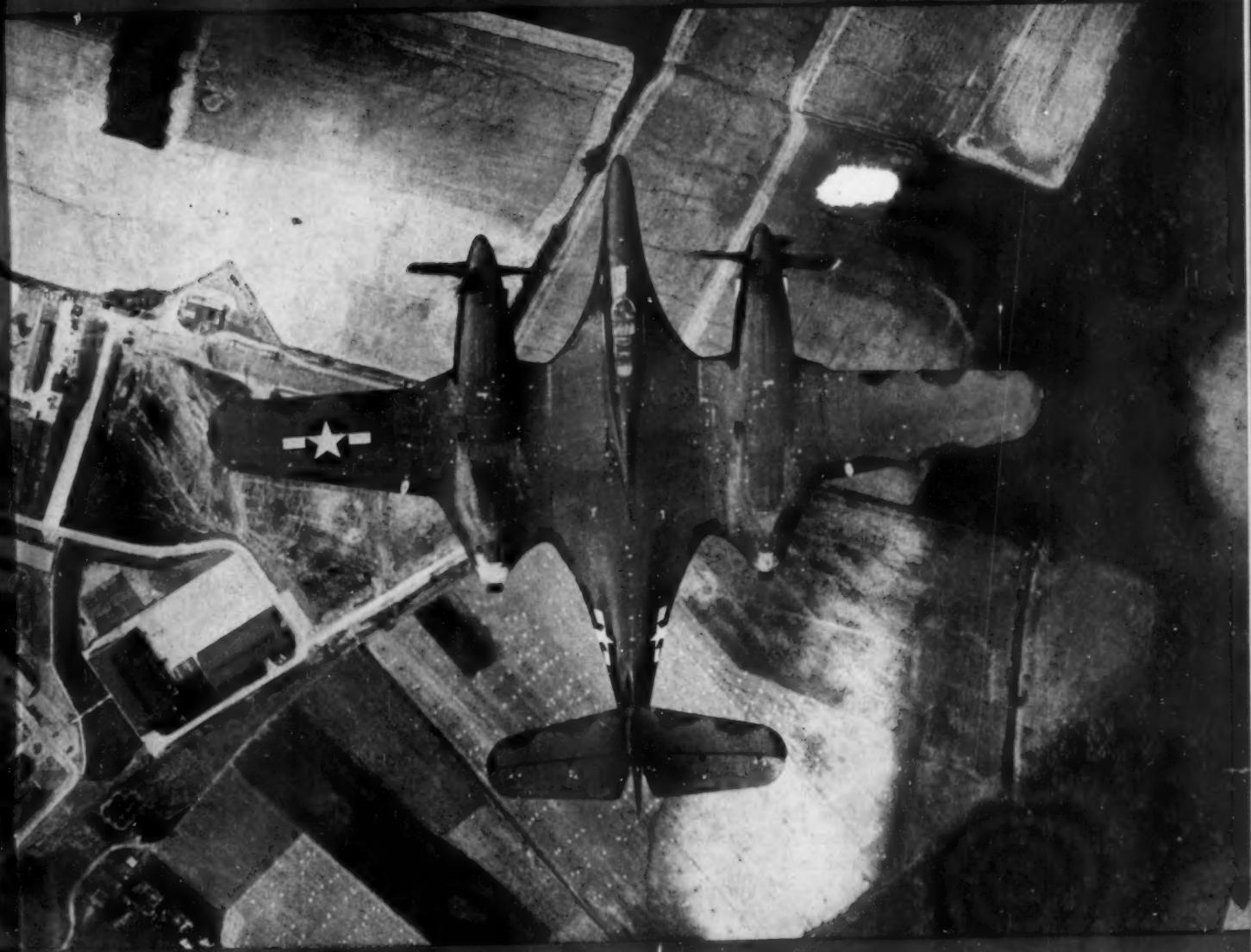
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TECHNOLOGY DEPT.

# SCIENCE NEWS LETTER

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DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE • FEBRUARY 24, 1945



Test Plane  
See Page 118

A SCIENCE SERVICE PUBLICATION



## How Television Got Its Electronic "Eyes"

As revolutionary as airplanes without propellers—that's how much electronic television differs from the earlier mechanical television!

Whirling discs and motors required for mechanical television were not desirable for home receivers. Pictures blurred and flickered.

But now, thanks to RCA research, you will enjoy all-electronic television, free from mechanical restrictions—"movie-clear" television with the same simplicity of operation as your radio receiver.

Such "let's make it better" research goes into everything produced by RCA.

At RCA Laboratories, world-famous scientists and engineers are constantly seeking new and better ways of harnessing the un-

believable forces of nature...for mankind's greater benefit.

Electronic television is but one example of the great forward strides made possible by RCA research—opening the way for who knows what new miracles?

When you buy an RCA radio or phonograph or television set or any RCA product, you get a great satisfaction...enjoy a unique pride of ownership in knowing that you possess the finest instrument of its kind that science has yet achieved.



**Dr. V. K. Zworykin, Associate Research Director** and E. W. Engstrom, Director of Research at RCA Laboratories, examining the Iconoscope or television "eye"—developed in RCA Laboratories for the all-electronic television system you'll enjoy tomorrow.

**RADIO CORPORATION of AMERICA**

PIONEERS IN PROGRESS



## ENGINEERING

# Air Position Indicator

**Gives continuous readings of latitude and longitude as the B-29 executes its mission to Tokio. Is first device to give such readings.**

► ABOUT the size of a quart milk bottle and mounted on the instrument panel of a B-29 Superfortress, the new air position indicator gives continuous readings of latitude and longitude as the heavy bomber executes its mission to Tokio. This is the first device to give such readings in the history of navigation on the sea or in the air.

Developed by the Eclipse-Pioneer division of Bendix Aviation Corporation, with the cooperation of the Air Technical Service Command at Wright Field and the Navy Department, the device eliminates the need for the navigator to work for hours with charts, basic navigational reference books, star-sighting sextants, and other aids to navigation to calculate the position of his airplane in flight.

The navigator of a B-29 can pinpoint his position on the map and keep the plane on the skyroad to Tokio or any other enemy target, by referring to two needles on a small instrument panel dial of the air position indicator marked off in degrees of longitude and latitude. This same dial also gives him a continuous

record of nautical miles flown and indicates the correct compass heading of the plane.

The API, as the device is known, is also being installed on other heavy bombers and on carrier-based Navy planes. In addition to the help it has given in blasting Japan, it has played an important role in the air-war over Europe.

The API computes the position of the plane in terms of latitude and longitude from physical data, obtained from the measurement of air speed and compass direction, called a "fix" by navigators. It compensates automatically for the earth's curvature, which causes convergence of longitude meridians between the equator and the north and south poles. It is constructed with a system of friction drives, cylinders and disks which delicately integrate all information needed.

With this equipment, the pilot or navigator merely sets his starting latitude and longitude and the proper magnetic variation. Then at any time in flight when he desires to know his air position, he merely reads the dial.

*Science News Letter, February 24, 1945*



**ROCKET GUNNER**—Garbed in asbestos and wearing a gas mask, this Navy man is charged with the duty of firing the rockets from a landing craft. He relaxes against the flag bag until the call to action. Official U. S. Navy photograph.

than apoplexy.

If these symptoms prove useful in predicting apoplexy, the way may be open for a search for methods to prevent it, the Indianapolis doctors point out. Such a method of predicting fatal apoplexy also will "offer assurance and comfort" to those with high blood pressure who probably will not die of apoplexy.

*Science News Letter, February 24, 1945*

## MEDICINE

# Five Signs of Death

**Severe headaches, dizziness, motor or neurologic disturbances, nosebleeds, and retinal hemorrhages may be signs foretelling death from apoplexy.**

► DEATH from apoplexy can be predicted from five signs or symptoms, Dr. R. D. Taylor and Dr. Irvine H. Page, of the Lilly Laboratory for Clinical Research at Indianapolis City Hospital, report, (*Journal, American Medical Association*, Feb. 17).

If any four of these five signs appear in a person with high blood pressure of the type termed essential hypertension, it may be assumed that the patient will die of apoplexy within eight-tenths of a year to five years or, on the average, within 2.1 years.

The five signs are: severe headaches

at the back of the head or the nape or scruff of the neck; vertigo (dizziness) or fainting spells; motor or sensory neurologic disturbances, such as memory defects, loss of ability to speak, and numbness and tingling; nosebleeds; and retinal hemorrhages without papilledema or exudates which the physician can determine from examining the eyes.

These five signs were observed consistently in 19 patients who died of apoplexy, or cerebral hemorrhage as it is also called. They were absent or negligible in 21 other high blood pressure patients studied who died of other causes

## AGRICULTURE

# Stored Corn in Midwest In Danger of Spoilage

► DURING last autumn and early winter, the U. S. Weather Bureau reminds, it was persistently wet and chilly in the Corn Belt. Immense quantities of corn finally had to be picked and cribbed in unsatisfactory condition, with moisture content too high for long storage.

As long as cold weather lasts, spoilage will not be great, but with warmer weather due soon it is feared that a great deal of corn will be ruined unless it is converted into meat as rapidly as possible.

*Science News Letter, February 24, 1945*

## PHOTOGRAPHY

# Aerial Photos at Night

Army Air Force photoreconnaissance pilots are now able to make low-altitude pictures of enemy installations at night without using flash bombs.

► IMAGINE the amount of light that would be forthcoming from 4,000,000 forty-watt bulbs of the type used around your home, and you'll have some idea of the amount of light used by Army Air Force photoreconnaissance pilots to make low-altitude pictures of enemy installations at night without the use of parachute flares or flash bombs.

Secret of the system for taking aerial photos at night is a quartz helix flash tube in which stored electrical energy from the airplane's 24-volt DC electrical system is discharged through the rare gas xenon. Krypton, argon and neon gases may also be used, but xenon gives the whitest light, most desirable for photography.

Flying at 5,000 feet, the new equipment, developed at the Massachusetts Institute of Technology by Dr. Harold Edgerton in cooperation with the Air Technical Service Command, takes 200 pictures in less than seven minutes, on a roll of film 150 feet long.

The unit consists of a K-29 aerial

camera, flash assembly, and a control box. The camera shutter is synchronized with the flash assembly, so that each picture is snapped at the instant the xenon flash bulb reaches its greatest sun-like brilliance. In operation the process is similar to that of taking regular flash pictures, except that the single bulb lasts for several hundred flashes and does not have to be replaced after every picture is taken.

The xenon bulb fits in a large reflector, 30 inches in diameter and 24 inches deep, made of spun aluminum, treated to produce a mirror-like finish.

The camera unit weighs 460 pounds and is suspended from a bomb-rack, so that it can be quickly dropped in case of emergency. It is waterproofed to permit use in the humid tropics. It will also perform efficiently in desert areas or arctic regions.

The remote control box can be set anywhere in the plane, so that the pilot, bombardier, or any crew member can snap the pictures, at the rate of one every few seconds.

Science News Letter, February 24, 1945

## GEOLOGY

# More Tungsten

► TUNGSTEN worth over \$300,000 has been taken since its discovery in 1942 from the first commercially workable source of tungsten found in the southeastern states, Gilbert H. Espenshade of the Geological Survey, U. S. Department of the Interior, told members of the Geological Society of Washington.

Although tungsten-bearing minerals are known to occur in a number of places in the eastern United States, and a few of these deposits in New England and the Maritime Provinces of Canada have been economically important in the past, most of the new discoveries stimulated by the war need for increased domestic supplies of tungsten have been in our western states, Mr. Espenshade stated.

The economically important deposits were discovered in eastern North Carolina and Virginia by two brothers, Joseph

and Richard Hamme, in Vance County, N. C., and Mecklenberg County, Va., about three and a half miles northwest of the village of Townsville, N. C.

The region has been examined and mapped by geologists of the Geological Survey in conjunction with the Bureau of Mines of the U. S. Department of the Interior. The deposits were found to occur as a series of veins in a belt about eight miles long and a mile wide.

Most of the tungsten-bearing quartz veins lie in granite, within 1,500 feet east of the point where the discovery was made. A series of short veins, each several hundred feet long, occur in a narrow zone of granite. West of this are larger veins, ranging in thickness from a foot to 30 feet and having a maximum length of 1,500 feet.

The richest veins are in a zone about two and a half miles long in the central

part of the district," reported Mr. Espenshade. "Drilling and underground mining to depths of nearly 200 feet below the surface have shown that there is practically no change in the character of the veins or the content of the ores. It seems reasonable to expect the veins to continue to greater depths."

Science News Letter, February 24, 1945

New tracer shotshells, used only in training airplane gunners, have within them a small metal capsule containing a tracer composition which, burning in flight, is visible in daylight.

## SCIENCE NEWS LETTER

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## PSYCHIATRY

# Returning Soldier Problem

The man who has adjusted well to military life will have more trouble than the NP in fitting back into civilian life, psychiatrist says.

► HELPING the returned soldier to fit back into his place in civilian life requires a teaming up of physicians with statesmen, sociologists, psychologists, industrialists and, in fact, society as a whole. Everyone must cooperate to make the effort a success, Dr. William Malamud, director of clinical psychiatry at Worcester State Hospital, told a meeting of the American Academy of Arts and Sciences in Boston.

Dr. Malamud is working with the research staff at Worcester in an investigation of the reconditioning and civilian readjustment of men who are psychiatric military casualties.

But it is not the NP casualty, the man

whose mind or whose nerves have been upset by military service, who is going to have the greatest difficulty in fitting back into the life of his community when he leaves the Army, Dr. Malamud told the meeting. Such casualties often occur in men who were not able to make the adjustment satisfactorily to military life. If they can be cured of their illness, and most of them can be cured readily, they should not have much difficulty in fitting back into the old pattern of civilian life.

"It is the soldier who has made a particularly good adjustment to military life," Dr. Malamud declared, "who will have the difficulty in readjusting himself to the community to which he returns."

Study of the NP's, however, and the reasons for their difficulty in adjusting to military life, as well as study of those who have nervous difficulties when they get home, may throw light on the problems faced by the well-adjusted soldier who must make a new readjustment after his separation from the service.

One veteran who came to Dr. Malamud's clinic had seen three years' overseas service in the Pacific. He needed help because on his civilian job he suffered marked restlessness, inability to concentrate on his work, jumpiness, vague pains, loss of weight and appetite and generally irritable and resentful attitude towards both employers and co-workers.

He had gone back to his old job, hoping to do the same kind of work he had done before he went into the Army at 18. But now he was 22 and still shaky from long hospitalization. Having lost about four years of work, he found that others who had stayed on the job were advanced to higher job levels. One of the boys he had started out with, and who had been rejected for service because of a physical defect, was now foreman.

The veteran was particularly resentful of this foreman, and any little criticism from him produced outbursts of anger and irritability and made the chest pains worse.

The solution was in a thorough physical examination which showed that the many physical symptoms were caused by emotional difficulties, and in transfer to another factory where the possibility for further education and training for a better job with new associates was assured. In the new job he was able to take advantage of what he had learned in his years of service and turn them into an asset rather than a loss.

Science News Letter, February 24, 1945

## CHEMISTRY

## Wax Heels and Toes for Longer Stocking Wear

► RUBBING a piece of candle wax or paraffin on the heels and toes of stockings before each wearing makes them last four times as long before holes appear, report textile specialists of the U. S. Department of Agriculture.

Laboratory tests show that a thin film of wax on stocking feet, routine treatment used long ago in wooden-shoe lands of Europe, will not interfere with the proper laundering of the stockings or change their appearance.

Science News Letter, February 24, 1945



**MEDIEVAL PHYSICIAN**—This panel of the east window in the Mayo Foundation House, shows the interior of the office of a medieval physician. The window is divided into three sections, representing the history of medical practice, the history of medical education, and the history of medical research. This photograph is reproduced from the Bulletin of The Medical Library Association, by Maj. Thomas E. Keys and Dr. Donald C. Balfour.

## AERONAUTICS

# Six New Planes

The Axis will never see the XP-55 "Ascender" or the XP-77, but these planes will make important contributions to future warplane development.

## See Front Cover

► SIX PLANES that the Axis will never see have been stripped of a cloak of secrecy by the Air Technical Service Command. Although these queer-looking planes will never see combat they are now winged classrooms that will make important contributions to future warplane development.

Looking something like a modified flying wing or possibly a vulture in flight, the Curtiss-Wright XP-55 "Ascender" is a pusher-type plane with an Allison "1710" engine mounted in the extreme rear, and with heavy forward-firing guns in the nose to balance the weight of the engine. The pilot is sandwiched in the fuselage between the guns and the engine.

This pusher plane does not have the conventional rudder. In its place it has vertical stabilizers, like the flippers of an Arctic seal, near the tips of its swept-back wing to aid directional control. The XP-55 has two elevator controls in the extreme nose, which stick out like small wings.

Next on the list is the XP-77, the only all-wood fighter developed thus far in World War II, and built by Bell Aircraft. This plane was designed when the metal shortage loomed critical, as an alternative. It has a hollow-propeller shaft, like the Airacobra, to permit the use of a single forward-firing cannon.

This single-seater plane used a small two-bladed metal propeller with a spinner hub. Speedy and highly maneuverable, it was designed for possible use against the fast-flying, sharp-turning Jap Zeros. The main difficulty seems to be that the nose wheels are always coming off in landings. However, with this fault rectified, it might be developed into a highly satisfactory trainer plane. It certainly bears watching.

Flying Elephant might be a good nickname for the XP-56, a test-tube airplane developed by Northrop. With a stubby fuselage extending into an engine nacelle, this early attempt at the flying wing looks for all the world like a baby elephant flying with the aid of its big

ears. Large fixed vertical fins above and below the fuselage give the "Dumbo" a sausage-like appearance when viewed from one angle. Two three-bladed counter-rotating pusher propellers mounted on the same shaft are powered by a radial engine. The weight of the engine is concentrated in the wing's mid-section.

The XP-75, intended as a composite airplane and designed by Douglas Aircraft, was to use assembly parts already in production for other airplanes. It has P-40 "Warhawk" wings, P-51 North American fuselage, F4U landing gear, and a Douglas A-24 tail. The finished product is a completely new design, long and slender, with very thin wings and a peculiar rudder shape. A 3000-horsepower Allison engine drives the two three-bladed coaxial counter-rotating props.

McDonnell Aircraft of St. Louis designed the XP-67, a single-seat interceptor plane built for a battery of fixed can-

non. This plane has a nacelle design that permits a certain amount of forward thrust from a jet of exhaust gases.

The twin-boomed, bullet-shaped XP-54, designed by Bell Aircraft, looks something like a P-38, but is a pusher plane, with an extremely low-drag wing. It is one of the first aircraft to have a flush-riveted skin that gives it the same smooth appearance as the fender of a car. Called the "Swoose Goose," because of its inverted gull wings, the plane has a four-bladed prop driven by a Lycoming in-line engine.

First pictures of these unusual-looking aircraft were published in *Air Force*, the official publication of the Army Air Forces. The release of this information is the first step on the part of the AAF to fill in existing gaps with descriptions of experimental planes which have provided much of the valuable knowledge needed to keep American aviation ahead in the war. The picture of the XP-67 shown on the front cover of this SCIENCE NEWS LETTER was taken by an Army Air Forces photographer.

Science News Letter, February 24, 1945

Meat production in Canada in 1944 exceeded all previous records, meat slaughtered in government inspected packing houses is 20% greater than in 1943.



**"ASCENDER"**—This XP-55, a cross between a flying bomb and a long-necked goose, flies better than it looks. Tailless, its elevator controls are in the nose, and the rudder control is on the sweptback wing tips. Powered by the Allison 1710 engine, from the ground the plane appears to be flying backwards. Official U. S. Army Air Forces photograph.

## CHEMISTRY

# "Stink Bomb" for Sharks

The repellent forms an inky black cloud when it is dissolved in water, causing sharks to turn tail and swim away from downed flyers.

► A NEW "stink bomb" for sharks chases them away from Army Air Force flyers downed in shark-infested waters. The new chemical weapon is obnoxious to the olfactory sense of sharks, keeping them away from flyers who use it. Dissolved in water, the repellent forms an inky black cloud that is almost odorless to humans, but to sharks it smells like decaying sharks' bodies, causing them to turn tail and swim off.

This effective deterrent to the toothed terrors of the deep is the product of several months' research which has resulted in the combining of a substance extracted from sharks' bodies and formed into a chemical salt, with a black dye that is so effective that it serves as a deterrent by itself. The dyes and chemical salt are pressed into a black cake, and packaged in a water-proof envelope which is attached to life vests. Downed flyers release the repellent into the water by ripping open the envelope tab.

Shark attacks on humans are rare, since man is not a shark's natural prey. The sight and smell of blood, however, doubles the danger to wounded flyers ditched in tropical waters. Comparatively rare though they are, shark attacks on humans are fatal in 80% of the cases.

Developed primarily by the Air Technical Service Command to remove an incidental terror of war from the minds of American flyers, the history of the new repellent is a good illustration of the cooperation between the military, scientists, and industrial researchers. The ATSC engaged as consultant Dr. W. D. Burden, of the American Museum of Natural History, who had worked on a similar project at the Woods Hole (Mass.) Oceanographic Institute under the Office of Scientific Research and Development. In the search for an effective repellent many substances were tried, with little success, until a study of fisherman's lore revealed that sharks do not venture into waters polluted by decaying bodies of their own kind.

Later the Calco Chemical Company, in cooperation with the Naval Research Laboratory of the Bureau of Ships, developed the black dye.

In open sea tests off the coast of South America and Florida, fish were thrown overboard from shrimp boats to attract sharks. The sharks struck in large numbers until the repellent was released into the sea. Then they dispersed and refused to venture back even after the repellent had become greatly diluted.

Convinced of the value of the shark chaser, the Army Air Forces is producing large quantities of shark-repellent packets.

*Science News Letter, February 24, 1945*

## AERONAUTICS

## Iowa Farmer Develops Catapult Pick-Up System

► TOWNS WITH a small population may benefit after the war from a catapult pickup device developed by a Midwestern farmer, Louis P. Wulf of Lost Nation, Iowa, that permits planes to swoop down, pick up air mail and express and continue on their flight without a stop (*American Aviation*, Jan. 1).

The device consists of a 40-foot tower on which is installed a cannon-like catapult. In operation, the parcel of mail or express to be picked up is placed in the cylinder of the cannon, and the device loaded with a cartridge which resembles a blank shotgun shell. At the top of the tower is a device that detonates the explosive charge when the trailing cable from the bottom of the plane passes through a slot, guided there by wires extending from two uprights on the approach side of the tower.

The explosion shoots the air-mail parcel at a speed synchronized with the ground speed of the aircraft. One or more cartridges may be used, depending on the weight of the package. The parcel hooks onto the trailing cable of the plane, which is raised to the aircraft by means of a small windlass operated through a door in the bottom of the fuselage.

An application has been made to the Civil Aeronautics Board by a company organized by Mr. Wulf for the operation of two pickup routes from Moline, Ill., across Iowa, to Omaha, Nebr., with pickup installations, costing about \$250

each, established at 70 towns on the routes. Plans made now involve the use of single-engine planes flying at a speed of about 110 miles an hour.

Handlers at each station will be equipped with short-wave walkie-talkie radios to contact ships several miles away and advise the plane of the weight of the parcel to be picked up. These handlers will also transport mail and express to the catapult and return with incoming parcels for delivery in the community.

While daylight operations are planned at the outset the report states that experimental night flights will be tried out, using neon lights to identify the towers from the air. The advantage of night operation lies in the fact that about 85% of the daily air mail is posted at the close of the day's business.

*Science News Letter, February 24, 1945*

## MEDICINE

## Penicillin Pills May Replace Injection Method

► PATIENTS taking penicillin in future may swallow the drug in a pill, or rather a gelatin capsule, instead of getting it by hypodermic injection, it appears from studies reported by Dr. Raymond H. Libby, of the American Cyanamid Company's research laboratories (*Science*, Feb. 16).

It has not heretofore been possible to give the mold chemical by mouth because its activity is so rapidly destroyed by the acid in the stomach. Dr. Libby reports he has overcome this difficulty.

Sodium or calcium salts of penicillin are suspended in cottonseed oil and then put into gelatin capsules. The gelatin capsule protects the penicillin from the stomach acid. The penicillin then becomes available through absorption into the blood from the small intestine.

Tests with animals and patients showed that the capsule method of giving penicillin is effective in keeping adequate concentrations of the drug in the blood for action against invading disease germs.

More penicillin apparently must be used but this, Dr. Libby suggests, will probably be offset by several factors. One is the greater ease, for both doctor and patient, of giving the drug by mouth instead of by injection. Another is that less highly refined penicillin should be satisfactory. This would simplify production procedures.

*Science News Letter, February 24, 1945*

## MEDICINE

## 24-Hour Recoveries From Severe Strep Throat

► PATIENTS with severe streptococcus sore throats start to improve within eight to 12 hours after the first injection of penicillin and are, as a rule, well within 24 hours, a group of Army medical officers found in studies reported in the *Journal, American Medical Association*, (Feb. 17).

Unless the patients continued to get penicillin treatment for six days, however, they suffered relapses.

The greater effectiveness of penicillin over sulfadiazine in throat infections with hemolytic streptococci is stressed in the report by Maj. Norman Plummer, Miss Dorothy Rhoades Duerschner, Maj. Harold Draper Warren, Capt. Francis T. Rogliano and Capt. Ruell A. Sloan.

"It should be used without delay in any serious, progressive hemolytic streptococci infection," they advise.

The most striking finding, they point out, was the disappearance of the streptococci from the nasopharynx within 24 hours. This raises a number of questions such as whether it is possible completely to eradicate the streptococci from the body and what effect this would have on the course of the disease and the development of rheumatic fever or kidney disease as complications of strep sore throat. The study does not answer these questions though it gave "some indication that complications of this disease can be prevented and effectively treated."

*Science News Letter, February 24, 1945*

## INVENTION

## Curved Knife Developed To Slit Clothing

► ARMY Air Force bombers overseas are now being equipped with a new kind of knife, especially developed to slit clothing, so that aircrews can quickly reach and treat wounds while the plane is still in combat.

Developed by the Aero Medical Laboratory at Wright Field, the new knife looks like a spoon with a short handle and the bowl flattened out, with the edges sharpened. Carried conveniently inside the plane in a leather sheath, the knife is attached to a string, so that it cannot easily be lost.

In case of an accident, the knife can be used to slit through the heaviest clothing, several layers at a time, without cutting into the wearer's body, a danger

when other types of knives are used. With the wound thus quickly exposed, treatment can be quickly given.

It is probable that these knives will become standard equipment for hospitals and ambulances, as well as police rescue squads, when getting at the wounds of a man in an accident may mean the difference between life and death.

*Science News Letter, February 24, 1945*

## ENGINEERING

## Batteries in Aircraft Protected Against Leaks

► CORROSIVE ACIDS from electric batteries cannot spill out and cause battery failure or damage to the plane on batteries equipped with a new valve vent. In combat flying, pilots frequently have to turn their planes upside down, causing battery acids to spill out.

The new valve vent, developed by the Auto-Lite Battery Corporation, seals the cells of the batteries in military aircraft when the plane is in any position but normal, as in a steep bank or upside-down flying. At the same time, it allows for perfect functioning by automatically opening the instant the plane returns to normal position.

Hydrogen and oxygen gases that accumulate while the battery is charging are thus allowed to exhaust without loss of vital battery acid.

*Science News Letter, February 24, 1945*

## AERONAUTICS

## New British Spitfire Is Fastest in Its Class

► THE SPITFIRE XIV, newest fighter plane of the Royal Air Force, is also the fastest Spitfire in service, attaining a speed of 450 miles an hour over a tactical range of 300 miles. This means that it can fly 300 miles from its base and still have enough gas left to return home.

Equipped with a five-bladed propeller and a 2,000 horsepower Rolls Royce Griffon engine, the plane has been in operation with the R.A.F. since D-Day last June. Only two American planes in the fighter class are equipped with engines of 2,000 horsepower. They are the P-47 Thunderbolt and the P-61 Black Widow.

One Spitfire pilot is reported to have shot down three German fighters in five minutes.

The high speed of the plane does not affect its maneuverability, according to the report from the British Information Services.

*Science News Letter, February 24, 1945*

# IN SCIENCE

## AERONAUTICS

## Helicopters Will Have Two Intermeshing Rotors

► THE AIR Technical Service Command is running tests of a new helicopter which at present looks like a jelly-fish with a windmill over its head. It has two rotors that rest in the same plane and intermesh with each other like gears.

Other recent developments in helicopters include an improved oil-cooling system for the XR-6 helicopter, all-metal rotor blades to replace wooden blades now used, and an automatic pitch reduction system. This mechanism operates in response to engine speeds, the pitch of the rotor blades being decreased when the engine drops below a predetermined speed.

*Science News Letter, February 24, 1945*

## PLANT PHYSIOLOGY

## Cooling Tomato Plants Boosts Fruit Production

► TOMATO PLANTS can be induced to produce most heavily by cooling them off in the afternoon, after their leaves have put in a good morning's work making foodstuffs with the aid of sunlight. This has been revealed by experiments at the California Institute of Technology reported by Prof. F. W. Went (*Science*, Jan. 26).

Many plants are stimulated to produce flowers and set fruit by changing the length of their daily exposure to light. Tomatoes are indifferent to length-of-day changes in light, Prof. Went states, but daily fluctuations in temperature affect them profoundly, no matter what the lighting conditions are. He also knew that so far as food-forming activity is concerned, the tomato plant's working day ends at about two o'clock in the afternoon, solar time.

Prof. Went put tar-paper covers over tomato plants grown outdoors in the California winter, starting after their day's food-forming work was done and keeping the covers on until the following morning. Plants thus treated formed and ripened good crops of tomatoes, while plants left uncovered as controls remained unproductive.

*Science News Letter, February 24, 1945*

## ONE FIELDS

## MEDICINE

**Penicillin Tried as Undulant Fever Treatment**

► A REPORT of a trial of penicillin in undulant fever has appeared in the *Journal of the American Medical Association*, (Feb. 10). The report was made by Drs. Carl G. Harford, Samuel P. Martin, Paul O. Hageman and W. Barry Wood, Jr., of St. Louis, and covered the use of penicillin in a number of other illnesses. The undulant fever case was that of a 20-year-old butcher in a large packing house in St. Louis. He was treated intensively for a week with penicillin without improvement. His fever continued and the germs continued in his blood.

"Too much significance should not be attached to this one case report," the doctors, however, point out.

Different strains of brucella, the germs that cause undulant fever, are known to vary in sensitivity to penicillin. Dr. Tsun T'ung, working at the Johns Hopkins School of Hygiene, found that eight out of 15 strains were susceptible to penicillin in test tube experiments and that addition of sulfathiazole enhanced the effect of penicillin.

It may be that the mold chemical will be effective in some cases and not in others, depending on the strain of germs that are causing the sickness. The question of whether or not to try penicillin is, of course, one for the patient's doctor to decide.

The layman should remember that while packing house employees, butchers, veterinarians and farmers may get the disease from infected animals or carcasses, it is usually contracted from drinking infected, raw goat's or cow's milk. Pasteurization of the milk is the safeguard against this source of the disease.

Science News Letter, February 24, 1945

## METALLURGY

**Extremely Hard Tool Steel Made by New Method**

► HARDER tool steels for faster production of the wares of war and more efficient reconversion to the works of peace, are promised in a new U. S. patent, No. 2,369,211, issued to F. H. Clark of New York City and R. F. Dirkes of Jamaica, N. Y.

Their process is a variant of the now familiar sintering method, wherein metallic powders are molded into the desired form and then heated until they become solid. The Clark-Dirkes steels are made by mixing into powdered iron or steel an excess of powdered carbides of tungsten, vanadium or other hardening alloy metal. When the sintering heat is applied, part of the hardening material blends with the iron, and the rest of the diamond-like particles remain unchanged, firmly embedded and bonded into the mass of the steel.

Science News Letter, February 24, 1945

## CHEMISTRY

**Undersea Electric Cables May Use Polythene Plastic**

► UNDERSEA electric cables may, in future days, be insulated with polythene plastic, it is predicted, because this material has excellent insulating qualities, is not attacked by seawater, resists penetration by moisture, and is unusually insoluble and inert to chemical reagents. It may be used also for protective coatings on machinery in or near salt water, to prevent corrosion.

This prediction was made by Dr. J. W. Shackleton of the plastics department of E. I. du Pont de Nemours and Company, at a meeting of the American Institute of Electrical Engineers.

"Polythene has very largely replaced all other materials in the insulation of military wires for high-frequency use," he said. "After the war it is expected that the use of polythene in electrical equipment will continue and expand, and that further varieties and modifications of it will be developed to meet specific needs."

Its good resistance to chemicals points to its utility in chemical equipment as a coating and gasketing material, the speaker continued. Its impermeability to moisture indicates a broad utility in containers and the packaging of foods. It is substantially unaffected at room temperature by concentrated hydrochloric, sulfuric, and even hydrofluoric acids, while nitric acid has no visible effect but does ultimately impair tensile strength and elongation.

Polythene, Dr. Shackleton explained, is the generic name applied by Imperial Chemical Industries, Ltd., who originally developed the material, and adopted by the Du Pont company to designate the "giant molecule" forms of ethylene suitable for use in plastics.

Science News Letter, February 24, 1945

## AERONAUTICS

**Prefabricated Servicing Shelter for Bombers**

► A PREFABRICATED servicing shelter in which Liberator bombers and several other types of aircraft can be serviced has been developed for use where permanent hangars or docks are not available. The structure, designed by Consolidated Vultee Aircraft Corporation, provides shelter for both ground crews and vital parts of the airplane itself, thus making possible more efficient work than when it is necessary to service aircraft in the open.

The side third section of the dock is curtained off. The curtains are raised to receive the front half of the airplane, then are drawn around the plane to make possible the servicing of the aircraft no matter what the weather outside. While its appearance does not suggest great strength, it is planned for use in all weather conditions and it is reported to be able to withstand winds of hurricane velocity, around 70 miles an hour.

The complete dock is prefabricated ready for shipping to any part of the world and is so designed that eight men can set up the building in 72 hours.

Science News Letter, February 24, 1945

## ORDNANCE

**Self-Propelled Gun Has 360-Degree Traverse**

► A NEW high-speed, highly agile self-propelled mounting for Bofors anti-aircraft cannon and similar light artillery has been designed by Horace D. Stevens of Akron. His patent, No. 2,367,837, is assigned to the Firestone Tire and Rubber Company.

The gun is mounted on a turntable which gives it a 360-degree traverse. It is carried on the bed of a truck or, preferably, a half-track vehicle to give it greater cross-country maneuverability. In march order, the muzzle of the gun projects forward through a notch in the windshield, and the crew are protected by walls of light bullet- and splinter-proof armor. In action, these fold downward, giving utmost freedom of action.

When it stops for firing, the vehicle is lifted on jacks and braced by outriggers, for greater steadiness. Chutes are provided through the floor, to get the empty cartridge cases from under foot and to drop them clear of the half-track mechanism.

Science News Letter, February 24, 1945

## ASTRONOMY

# Mercury in Evening Sky

**Mercury, Venus, Jupiter and Saturn are all visible at once at the end of March, but this will require very clear skies down to the horizon.**

By JAMES STOKLEY

► IN THE FALL of 1939 we had the privilege of seeing all five naked-eye planets—Mercury, Venus, Mars, Jupiter and Saturn—lined up in a row in the western evening sky. Such a display will not come again for a long time, but at the end of March four of these planets, that is, all except Mars, will be in the sky at the same time. Mercury is the most rarely seen of all these five, since it never appears except low in the east just before sunrise or low in the west just after sunset. On March 26 it reaches the latter position, called "greatest eastern elongation." Then it will be in the constellation of Pisces, the fishes, and will set nearly two hours after the sun. Thus, as the twilight is gathering around the 26th you may look to the west, and if you see a bright "star" it will be Mercury, for no other object in that direction is likely to be mistaken for it.

Since the accompanying maps are prepared for somewhat later in the evening—11:00 p. m. March 1, 10:00 p. m. on the 15th and 9:00 p. m., war time, on the 31st, Mercury is not indicated on them, for Pisces will have set. However, there are three other planets which are shown. There is Venus, brightest of all, at its greatest brilliance, toward which it has been brightening for many months. It is in the west in the constellation of Aries, the ram, and on March 10, when it attains maximum brightness, will be of magnitude minus 4.3 on the astronomical scale.

### Saturn Is Next

Swinging toward the south the next planet we come to is Saturn, which is in Gemini, the twins, close to the stars that mark the foot of Castor, one of these boys. Its magnitude is 0.2, which makes it brighter than any star except Sirius, the dog star, which is below it.

Toward the east is Jupiter, in the figure of Leo, the lion, near the star marking the beast's hind foot. On March 13 Jupiter is at opposition which means that it is directly opposite the sun, so it rises as the sun sets. Therefore, when Mercury

makes its appearance around the 26th, it will be possible, though perhaps not easy, to see Jupiter before Mercury has disappeared, and this will put four naked eye planets into the sky at once. This will, however, require very clear skies down to the horizon both in the east and west, and that condition may be hard to find.

When Jupiter is in opposition, as in March, the earth is on the same side of the sun as the planet, so that we are closest, and that planet is brightest. Jupiter's magnitude is minus 2, brighter than any other except Venus. Its distance on the 13th is 412,200,000 miles.

### Mars Is Not Visible

Mars, the remaining planet, is not visible these evenings. It is very close to the sun and rises a short time before sunrise. Because it is now far on the other side of the sun, it is very faint, and hard to see. But there is another planet in the evening sky, one that this month is also at opposition and at the greatest brightness; not enough, however, to make it visible to the naked eye. This is Neptune, which is in Virgo, below Jupiter. Opposition is on March 25 when the distance is 2,720,000,000 miles.

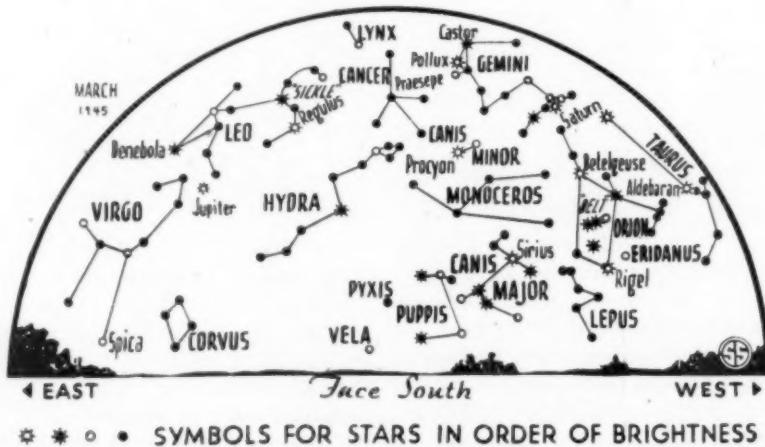
The chief stars to look for this month are those in the southwest in and around the constellation of Orion. In Orion itself are two first magnitude stars—Betelgeuse, above, and Rigel, below. Above Orion are Gemini, the twins, in

which Saturn stands, and with first magnitude Pollux. Below Pollux is Procyon, in Canis Minor, the lesser dog. Still nearer the horizon is the great dog, Canis Major, with Sirius. Taurus, the bull, is in the west, with brilliant Aldebaran. Next to Taurus is Auriga, the charioteer, with Capella, another of the first magnitude.

Coming up in the east are some other first magnitude stars. There is Regulus, in Leo, the lion. Below is Spica, in Virgo, the virgin, though this star is so low that it does not appear at full brilliance. A little farther north is Arcturus, in Bootes, the bear-driver.

Mercury, which makes its most favorable appearance of the year in March, is the closest of the planets to the sun. Instead of the 93,000,000 miles separating the sun from us, Mercury is only 36,000,000 miles from the center of the solar system, and thus it gets far more heat in the form of radiation from the sun. Its diameter is only 3,010 miles, and it turns on its axis once in 88 days, the time that it requires to revolve around the sun. That means that it always keeps practically the same hemisphere toward the sun, just as the moon does toward the earth. One half of Mercury, therefore, is probably very hot, with the temperature high enough to melt lead, while the opposite half, where the sun never shines, is very cold.

On Mercury there seems little possibility of any atmosphere which might ameliorate this condition to some extent. For every planet there is a speed, called the velocity of escape, at which an object can be projected to overcome completely the gravitational attraction. At





the surface of the earth it is about seven miles per second, but for Mercury, it is only 2.2 miles per second.

Now this speed applies to any object, whether it is as big as a house—or a rocket ship—or a single tiny molecule. Our atmosphere consists of molecules of nitrogen and oxygen, which are in constant movement, but the average velocity is considerably less than seven miles per second. Only occasionally will an air molecule at the top of the atmosphere move fast enough to leave the earth completely, and join the stray molecules moving around in space.

On Mercury, however, the speed of movement of such molecules would be greater, because of the higher temperature. Thus, if Mercury were by some miracle to be suddenly endowed with an

atmosphere like ours, it would soon lose it. In view of this, Mercury seems quite unsuitable as the possible abode of life.

#### Celestial Time Table for March

Mar.	EWT	
2	3:00 a.m.	Moon farthest, 252,200 miles.
7	12:30 a.m.	Moon in last quarter.
10	4:00 a.m.	Venus greatest brilliancy.
13	8:00 a.m.	Jupiter nearest, distance 412,200,000 mi.
	11:51 p.m.	New moon.
14	5:00 p.m.	Moon nearest 222,300 miles.
16	6:30 a.m.	Moon passes Venus.
20	3:11 p.m.	Moon in first quarter.
	7:38 p.m.	Spring commences.
25	10:54 p.m.	Moon passes Saturn.
26	5:00 a.m.	Neptune nearest, distance 2,720,000,000 miles.
		Mercury farthest east of sun.
27	1:13 a.m.	Moon passes Jupiter.
28	1:44 p.m.	Full moon.
	8:00 a.m.	Moon farthest, 252,600 miles.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

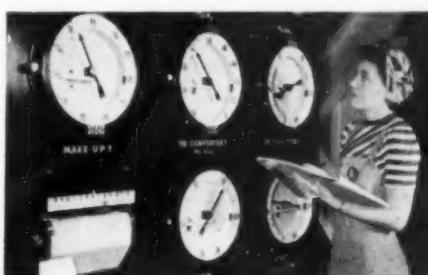
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states that the use of the walk-around oxygen equipment does not eliminate the need for wearing life vests.

The primary job of the walk-around oxygen equipment is to give airmen freedom to move about their bomber at high altitudes, without risking their lives through the removal of their oxygen masks. Pilots and air crewmen need oxygen at high altitudes because without it they have faulty judgment, poor coordination, and short memory.

Atmospheric pressure, which under normal conditions near sea level forces oxygen into the blood stream through the lungs, falls off at high altitudes so that less oxygen actually gets into the blood, unless an oxygen mask is used.

The walk-around oxygen unit consists of a low-pressure oxygen cylinder with a harness, and a regulator which dilutes oxygen with air whenever it is safe to do so, and supplies more oxygen on demand. The same mask that is used with a regular oxygen station can be used with the walk-around assembly. In addition to allowing airmen to move around the plane away from their oxygen stations, walk-around bottles can be used to revive a crew-member. (Turn to Page 127)



#### HOW T.V.A. NITRATE PLANT SPEEDS GAS ANALYSES

Gas Analyses, made automatically and continuously, are an important feature in the great T.V.A. Nitrate Plant No. 2 at Muscle Shoals, Ala. Here nitrogen is extracted from the air and made available for explosives, fertilizer, etc.

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#### INVENTION-PHYSIOLOGY

## Walk-Around Oxygen Unit

Helps save the lives of airmen by enabling them to breathe under water as well as by supplying oxygen at high altitudes.

► **WALK-AROUND** oxygen units help save the lives of airmen by enabling them to breathe under water while trying to escape from their downed bomber planes, as well as by supplying vitally-needed oxygen at the high altitudes at which modern bombers fly.

Many men, uninjured when their shot-up planes crashed into the sea, have lost their lives by drowning because they were unable to breathe under water while trying to escape through hatches and windows. The walk-around equipment enables them to breathe while finding a way out of the plane, bob up to the surface of the water, and float for a time as

though buoyed up by life vests.

The new equipment was developed by Capt. W. C. Kulesz, of the Aero Medical Laboratory at the Air Technical Service Command. Length of functional time depends upon water pressure as well as on the pressure in the oxygen bottle or cylinder. Approximate durations obtained during tests were six minutes at a depth of 10 feet, five minutes at 20 and 25 feet and 3.5 minutes at 50 feet.

Instructions to flyers in doomed bombers direct the men to don their portable oxygen equipment immediately after bracing themselves in ditching position for the impending impact. Capt. Kulesz

## Do You Know?

California and Iowa rate first and second in U. S. honey production.

High temperatures are not pleasing to *desert reptiles* as commonly supposed; all of them will die if exposed too long to direct summer sun.

Several billion bacteria were found in a teaspoonful of scrapings from the hull of a boat that had been in the water 36 months.

*Silicone rubber*, a new synthetic, is as pliable as soft putty, but when rolled into a round mass will bounce like a natural rubber ball.

Dogs have proved valuable in the war because their keen sense of smell can detect a strange presence at distances up to 500 feet depending on weather and wind conditions.

Nearly 20,000,000 *fur-bearing animals* were taken in the United States and Alaska during 1943; the fur catch was worth approximately \$100,000,000 to the trappers.

As *animals* are not allowed in public air raid shelters in England, at the height of the London raids, 7241 animals which had been buried under debris were rescued in a single week.

*Cabbage* contains a substance, though not as strong as penicillin, that acts against bacteria, and its presence in sufficient quantity is believed to prevent the development of objectionable colors, odors, and flavors in sauerkraut.

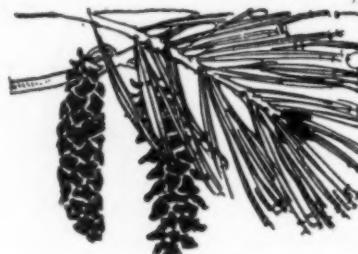
The pine-looper, a forest pest known technically as *Bupalus piniarius*, is being killed in Sweden by spraying from a low-flying plane a preparation called gesarol which is harmless to humans and higher animals.

Long, narrow, irregularly-shaped *oysters*, found on uncultivated reefs in the South, are known as coon oysters, and owe their shape, it is thought, to soft, muddy bottoms and over-crowding of oysters in a narrow zone.

Largest and most prized member of the herring family is the *shad*, generally regarded as one of the best fishes of the Atlantic Coast; it is now a Pacific Coast fish since its transplanting there in the 1870's.

BOTANY

**NATURE RAMBLINGS**  
by Frank Thone



Evergreen Leaves

► EVERGREENS, we are rather prone to assume without thinking particularly about it, hang onto their leaves indefinitely. We see perennial green on needle-leaved trees like pine and spruce, or broad-leaved ones like magnolia and holly, and it seems as if they always kept the same set of leaves. When we walk under them we of course realize immediately the error of such an assumption, for the ground is always littered with brown, dead foliage—often carpeted with these discarded leaves.

Actually, each kind of evergreen has its own length of leaf-life and its own mode of letting go of dead leaves. Pines, for example, keep their leaves from two to half-a-dozen years, according to species. Magnolias generally lose last year's leaves during the current year's growth.

You can get a pretty fair indication of how long an evergreen tree or shrub hangs onto its leaves by looking at the twigs. If the leaves are bunched out near the ends, they don't stay on very long after their first season; if they clothe the twigs "way back to the elbows" they are more persistent. You can get a more exact notion by looking for the circling clusters of leaf-scars that mark the ends of each year's growth. Counting backward from the ends of the present shoots, you can easily tell how old a given twig is, until the bark grows so rough that the leaf-scars are lost.

As new leaves unfold from their buds in spring, there is a sharp color contrast between them and the persisting older leaves. New leaves are light green, even pale; old leaves are dark. As spring passes over into summer, however, this color difference is lost in the darkening of the maturing leaves.

CHEMISTRY

### Activated Clay Filter For De-Leading Gasoline

► DE-LEADING leaded gasoline is something soldiers very much want to do, when they need field-stove fuel or cleaning fluid and only ethyl gasoline is available. To accomplish this, F. E. Neef, Jr., of Detroit, has invented a process on which he has received U. S. patent 2,368,261. Rights to manufacture and use are assigned, royalty-free, to the government.

The process is quite simple. It consists merely in filtering the gasoline through a column of fine-grained clay (bentonite) which has been activated either by heating or by treatment with hydrochloric or sulfuric acid. The inventor states that the action is not a simple physical filtering one, but that there is a chemical reaction between the dissolved chemical and the activated clay.

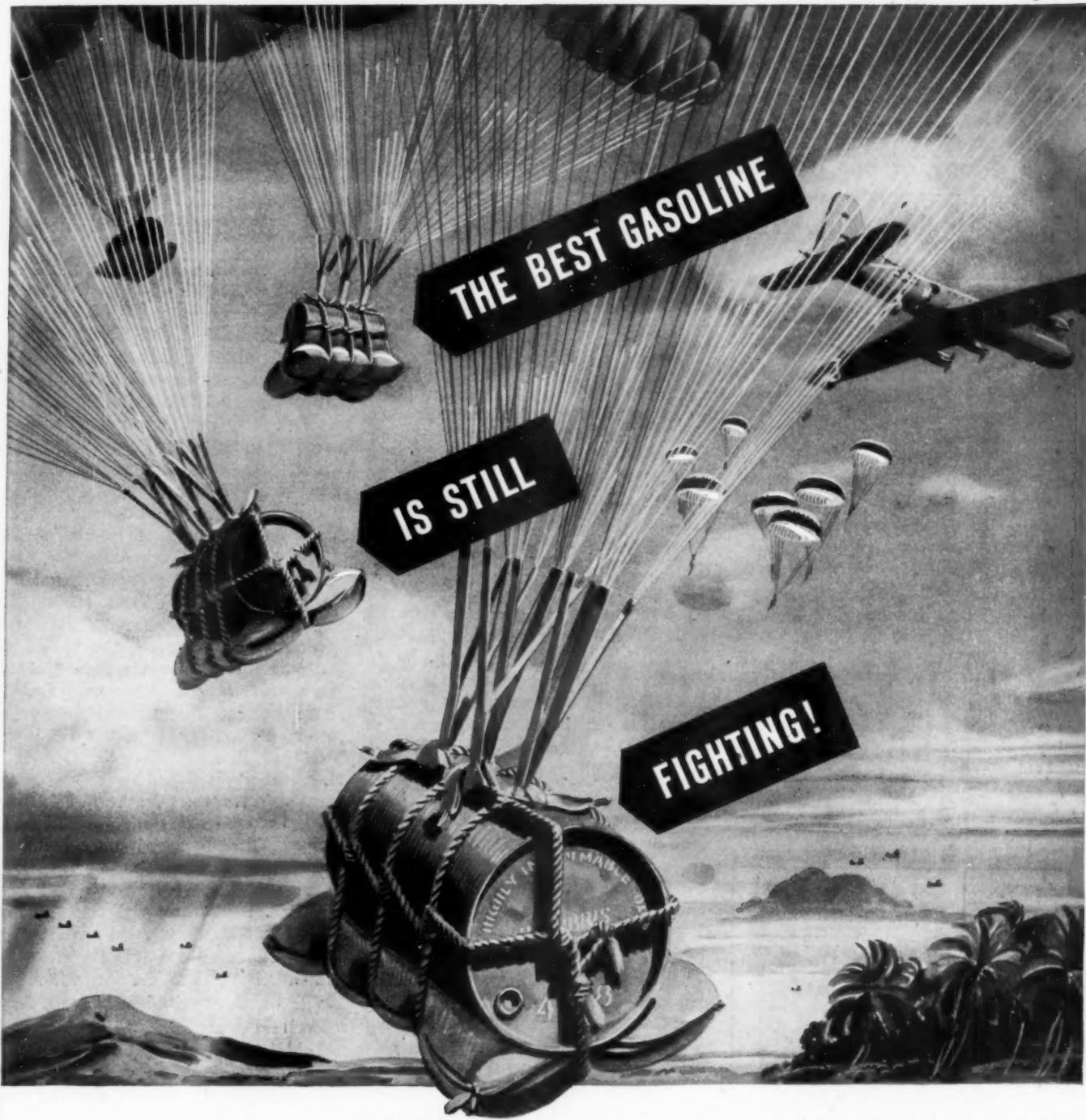
Science News Letter, February 24, 1945

## Facts ABOUT



### SCIENCE AT THE BATTLEFRONT

— — — LISTEN — — —  
"ADVENTURES IN SCIENCE" WITH WATSON DAVIS and Rear Adm. J. A. Furer, U.S.N. SATURDAY, MARCH 3 2:15 EWT—CBS Science Service Radio Feature



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## RESEARCH

# Weapons For Future Wars

Many of our best known leaders are at work on numerous projects in university laboratories, research institutes and industrial plants.

► MANY of America's best known leaders in science are already at work on weapons that will be used by the United States in the event of another war emergency. They function collectively as the new Research Board for National Security.

Numerous projects are under way now in university laboratories, research institutes and industrial plants. To reveal nature and subjects of these experiments at this time might endanger national security.

Working to develop new weapons, without compensation except for expenses, are such men as Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, Dr. H. S. Gasser, director of the Rockefeller Institute for Medical Research; Rear Admiral J. A. Furer, coordinator of Research and Development in the Navy Department; Dr. E. O. Lawrence, professor of physics at the University of California; and Vice Admiral Ross T. McIntire, Chief of the

Navy's Bureau of Medicine and Surgery.

As members of a 40-man committee of the National Academy of Sciences, created by Dr. Frank B. Jewett, president of the Academy, at the request of Henry L. Stimson, Secretary of War, and James Forrestal, Secretary of Navy, these men are formulating programs of scientific research and development to strengthen national security. Appointment of this committee results from a report of the Congressional Committee on Postwar Research and Development, headed by Charles E. Wilson, which advised the setting up of such an organization to continue and expand in peacetime scientific research on the mechanisms and devices of warfare carried on in wartime by the temporary emergency Office of Scientific Research and Development. The research board has already taken over several of the OSRD projects.

Conspicuous by his absence from the new committee is Dr. Vannevar Bush, of the Carnegie Institution of Washington, and now director of OSRD. Although he was invited to become a member of the new committee, Dr. Bush declined, stating that he did not want to appear to dominate the new organization.

Chairman of the Research Board for National Security is Dr. Karl T. Compton. Cooperating with him are four members of the executive committee: Dr. Roger Adams, head of the department of chemistry at the University of Illinois; Dr. A. R. Dochez, professor of experimental medicine and surgery at the College of Physicians and Surgeons, Columbia University; Brig. Gen. W. A. Borden of the War Department Special Staff; and Rear Admiral Furer. Board members include 17 civilians, selected by the National Academy of Sciences, nine representatives of the Army selected by the War Department, and nine representatives of the Navy, selected by the Navy Department. Placement of military members of the armed forces in reserve status after the war is not expected to affect their participation in the research program.

While the board is set up only on a

temporary basis, it is believed by many informed observers in Washington that it will be permanently established by act of Congress. In the event that Congress establishes a new organization, the research activities now under way will be transferred to it. The Woodrum committee is now considering a permanent organization.

Other members of the research committee are: Dr. E. K. Bolton, E. I. du Pont de Nemours and Company; Dr. Oliver E. Buckley, Bell Telephone Laboratories; Bradley Dewey, Dewey and Almy Chemical Company; Dr. Lee A. Du Bridge, NDRC; Dr. H. S. Gasser, Rockefeller Institute for Medical Research; Dr. A. Baird Hastings, Harvard University; Dr. J. C. Hunsaker, NACA; Dr. W. S. Hunter, Applied Psychology Panel, NDRC; Zay Jeffries, General Electric Company; Dr. C. C. Lauritsen, California Institute of Technology; Dr. E. O. Lawrence, University of California; Dr. Linus Pauling, California Institute of Technology; H. W. Prentis, Jr., Armstrong Cork Company; Dr. I. I. Rabi, Columbia University; Dr. Elvin C. Stakman, University of Minnesota; Dr. Oswald Veblen, Institute for Advanced Study, Princeton; Dr. Lewis H. Weed, National Research Council; Dr. E. L. Bowles, expert consultant to the Secretary of War; Maj. Gen. Levin H. Campbell, Jr., Chief of Ordnance; Lt. Gen. B. M. Giles, Army Air Forces; Maj. Gen. John E. Hull, Chief of Operations Division; Maj. Gen. Harry C. Ingles, Chief Signal Officer; Maj. Gen. Norman T. Kirk, Surgeon General of the Army; Maj. Gen. William N. Porter, chief, Chemical Warfare Service; Maj. Gen. Wilhelm D. Styler, Chief of Staff, Army Service Forces; Maj. Gen. Albert W. Waldron, chief, Requirements Section, Army Ground Forces; Vice Admiral Frederick J. Horne, vice chief of naval operations; Vice Admiral Ross T. McIntire, chief, Bureau of Medicine and Surgery; Vice Admiral Ben Moreell, chief, Bureau of Yards and Docks; Rear Admiral H. G. Bowen, special assistant to the Secretary of the Navy; Rear Admiral W. J. Carter, assistant chief, Bureau of Supplies and Accounts; Rear Admiral E. L. Cochrane, chief, Bureau of Ships; Rear Admiral W. S. De Lany, assistant chief of staff, Readiness Division; Rear Admiral George F. Hussey, Jr., chief, Bureau of Ordnance; Rear Admiral DeWitt C. Ramsey, chief, Bureau of Aeronautics.

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# Books of the Week

► COMMITTEE REPORT, prepared by over 40 electrical engineers in electrical equipment and other industries and in public utilities, is included in ELECTRIC POWER DISTRIBUTION FOR INDUSTRIAL PLANTS. It is an authoritative and valuable publication for those engaged in the design, construction and maintenance of electrical power installations. (American Institute of Electrical Engineers, \$1.)

Science News Letter, February 24, 1945

OVER 10,000 useful metallurgical terms are included in METALS AND ALLOYS DICTIONARY, an up-to-date reference work, by Dr. M. Merlub-Sobel, containing definitions of these terms, and the composition, properties and uses of the important commercial alloys. It is written in language which the layman can easily understand. (Chemical Pub. Co., \$4.50.)

Science News Letter, February 24, 1945

## Just Off the Press

THE ANNUAL OF THE AMERICAN SCHOOLS OF ORIENTAL RESEARCH, For 1943-1944—Millar Burrows and E. A. Speiser, eds.—*Am. Schools of Oriental Research*, 162 p., illus., \$2.50.

THE BOY CHEMIST—A. Frederick Collins—*Odyssey*, 341 p., illus., \$2.75, rev. ed.

AN ESSAY ON THE PSYCHOLOGY OF INVENTION IN THE MATHEMATICAL FIELD—Jacques Hadamard—*Princeton Univ. Press*, 143 p., \$2.

AN INTRODUCTION TO ELECTRONICS—Ralph G. Hudson—*Macmillan*, 97 p., illus., \$3.

ELECTRIC POWER DISTRIBUTION FOR INDUSTRIAL PLANTS—A. I. E. E. Committee on Industrial Power Applications—*Amer. Inst. of Elec. Eng'rs*, 107 p., paper, illus., \$1.

JAPAN AND THE JAPANESE, a Military Power We Must Defeat, a Pacific Problem We Must Solve—The Editors of Fortune—*Infantry Journal*, 166 p., paper, illus., \$25c.

LATIN AMERICAN UNIVERSITY JOURNALS AND SERIAL PUBLICATIONS, a Tentative Directory—Katherine Lenore Morgan—*Pan American Union*, 74 p., paper, 50c.

MICROBIOLOGY AND PATHOLOGY—Charles F. Carter—*Mosby*, 777 p., illus., \$3.50, 3rd ed.

POET PHYSICIANS, an Anthology of Medical Poetry Written by Physicians—Mary Lou McDonough, comp.—*C. C. Thomas*, 210 p., \$5.

PRACTICAL MARINE NAVIGATION—James A. Stowell—*Addison-Wesley Press Inc.*, 133 p., illus., \$2.50.

THE PSYCHIATRIC NOVELS OF OLIVER WENDELL HOLMES—Clarence P. Oberndorf—*Columbia Univ. Press*, 268 p., \$3.

STABILIZING THE CONSTRUCTION INDUSTRY—Miles L. Colean—*Nat. Planning Assn.*, 38 p., paper, illus., 25c (Planning Pam. No. 41).

TWO BILLION ACRE FARM, an Informal History of American Agriculture—Robert West Howard—*Doubleday*, 209 p., \$2.50.

THE USE OF PERSONAL DOCUMENTS IN HISTORY, ANTHROPOLOGY, AND SOCIOLOGY—Louis Gottschalk and others—*Social Science Research Council*, 243 p., paper, \$1.50 (Bull. 53).

Science News Letter, February 24, 1945

## NUTRITION

### Fermented Grass Leaves Produce New Beverage

► NEBUCHADNEZZAR took his grass straight, like a cow; we moderns may get it as an amber-colored drink. Patent 2,369,042, issued to W. R. Graham, Jr., and C. W. McCarty of Kansas City, Kans., covers a process for making a dark beverage out of grass or sprouted grain foliage that has been wilted and slightly crushed to release the digestive enzymes, then permitted to ferment naturally for anywhere from three hours to three days. Dried for storage and shipment, the product may be soaked in water to produce the beverage whenever desired. Patent rights are assigned to American Dairies, Inc., and the Quaker Oats Company.

Science News Letter, February 24, 1945

## From Page 123

ber who gets into trouble away from his oxygen station, or as extra oxygen stations in case the plane's oxygen system should be put out of commission.

When full, the cylinder contains oxygen at a pressure of 425 pounds per square inch. Depending upon the wearer's activity, altitude of flight, and on which of three styles of bottles is in use, the oxygen will last three to 50 minutes.

Curiously enough, the higher the altitude, the longer the oxygen will last. The more active a person is, the less time it will last. Flyers are instructed to recharge their bottles as soon as the pressure gauge reaches 100 pounds per square inch. There is a recharger hose at every oxygen station on a bomber.

Science News Letter, February 24, 1945

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# • New Machines and Gadgets •

• ROTOTILLERS may replace plows and harrows in tilling American farms. They dig up, churn and crumble the soil with steel picks rotating like paddle-wheels, preparing a seed bed in one operation. Used for years in Switzerland, the Rototiller is now made and used in America.

Science News Letter, February 24, 1945

• RE-INKING device for typewriter ribbons applies ink uniformly as the ribbon is passed from a spool to be rewound on a reel. The ribbon is run between two pads which are inked from a reservoir, and then between rollers that spread the ink and force it into the fabric.

Science News Letter, February 24, 1945

• ACID-PROOF apron for heavy duty is made of a treated fabric combined with a new plastic by a special calendering process which makes material acid-proof throughout. It can be washed and cleaned without injury to the acid-proofing qualities.

Science News Letter, February 24, 1945

• PRUNING SHEARS, operated by fluid pressure from a power cylinder mounted on the lower end of a pole, close and cut when the compressed air or other fluid carried in a tank is released to the cylinder by means of a push-button valve. The cutting blades are opened by a spring.

Science News Letter, February 24, 1945

• HEELS for ladies' shoes shown in the picture have an outside covering of



thermoplastic evenly distributed about a sixteenth of an inch thick and without seams. The plastic slightly impregnates the wooden core to form a permanent bond. Dull or shiny finishes in many colors are available.

Science News Letter, February 24, 1945

• TOBACCO PIPE with a grate and ash pit, recently patented, gives a clean, cool smoke, it is claimed, and keeps moisture away from tobacco and pipe-stem. The grate is a perforated disk in the bottom of the bowl; the ash pit is a horizontal tube below, into which the stem fits. A plug at the rear permits cleaning.

Science News Letter, February 24, 1945

• LAMP CHANGER for elongated electric discharge lights of the fluorescent type is a grasping device on a long pole permitting the user to stand on the floor. With it he grasps the tube, rotates it 90 degrees, and pushes a hand-grip attached to a rod inside the pole that operates the releasing device.

Science News Letter, February 24, 1945

• NON-SPLITTING nail, for thin molding strips and other fine woodwork, has two sharpened cutting edges forming a V-shaped groove across the end instead of the ordinary wedge-shaped point. These edges cut the fiber as the nail is driven.

Science News Letter, February 24, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 247.

## Question Box

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### ENGINEERING

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### INVENTION-PHYSIOLOGY

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### NUTRITION

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### PHOTOGRAPHY

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Why will the man who has adjusted well to military life have more trouble than the NP in fitting back into civilian life? p. 117.

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